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16. A semiconductor memory device according to claim 7, wherein said wiring line is disposed parallel to said wiring line structure.

REMARKS

Claims 1-16 are pending in the application. Claims 8-14 are withdrawn from present consideration. By this Amendment, claims 1, 4, 5 and 7 are amended and claims 15 and 16 added. No new matter is added to amended claims 1, 4, 5 and 7 or to new claims 15 and 16. Reconsideration in view of the foregoing amendments and the following remarks is respectfully requested.

Claims 1-6 stand rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,111,301 to Stamper. Claim 7 stands rejected under 35 U.S.C. §103(a) as unpatentable over Stamper in view of U.S. Patent No. 6,162,686 to Huang et al. (hereinafter, Huang).

These rejections are respectfully traversed in view of the following discussion:

I. THE CLAIMED INVENTION

The claimed invention is directed to a semiconductor memory device, including a copper fuse section that is oxidized by a laser beam in an oxidizing environment. The semiconductor memory device includes a dielectric film, a wiring line structure, and an opening. The dielectric film includes a first film section formed on a substrate, a second film section formed on the first film section, and a third film section formed over the second film section. The wiring line structure includes a first and second wiring line, each of the first and second wiring lines formed on the second film section of the dielectric film and extending in opposite directions, and a copper fuse section formed on the first film section of the dielectric film, an end of the copper fuse section being connected to the first wiring line and another end of the copper fuse section being connected to the second wiring line. The opening is formed in the third and second film sections of the dielectric film and between said first and second wiring lines. The opening provides access to the laser beam to oxidize the copper fuse in the oxidizing environment.

II. THE PRIOR ART REFERENCES

A. The Stamper Reference

In Fig. 2, Stamper discloses *inter alia* a first SiO₂ layer 8, corresponding to the claimed invention's first film section of the dielectric film. Stamper also discloses a fusible conductor 2 of copper formed on the first SiO₂ layer 8 (Fig. 2). Stamper further discloses the fusible conductor 2 is connected to two metal layers 6, corresponding to the first and second wiring lines of the claimed invention, through a barrier layer 3. In particular, Stamper discloses that the two metal layers 6 are located above the fusible conductor 2 and each of the two metal layers 6 extends away from the fusible conductor 2 (Fig. 2).

Claim 1 recites at least the features of "a dielectric film including ... a second film section formed on said first film section, and a third film section formed over said second film section; ... and an opening formed in said third and second film sections of said dielectric film." Stamper discloses that the remaining SiO₂ structures 8 formed above the fusible structure 2 share a common base level but do not form separate layers, corresponding to the second and third film sections of the dielectric film of the claimed invention. Therefore, Stamper does not disclose, teach or suggest a dielectric film including a first film section formed on a substrate, a second film section formed on said first film section, and a third film section formed over said second film section as recited in claim 1. In addition, the remaining SiO₂ structures 8 formed above the fusible structure 2 of Stamper cannot be described as a third film section formed over the second film section, as recited in the claimed invention. Furthermore, Stamper does not disclose, teach or suggest an opening formed in said third and second film sections of said dielectric film as further recited in claim 1.

For at least the reasons outlined above, Applicant respectfully submits that Stamper does not disclose, teach or suggest every feature of claim 1. Accordingly, Stamper does not anticipate or render obvious the subject matter of claim 1 and claims 2-6, which depend from claim 1. Withdrawal of the rejection of claims 1-6 under 35 U.S.C. §102(e) as anticipated by Stamper is respectfully solicited.

B. The Huang Reference

In Fig. 5, Huang discloses *inter alia* fuse window 84 formed at least partially through

the passivation layer 76, 80 and the third IMD (InterMetal Dielectric) layer 66.

Huang does not cure the deficiencies of Stamper. Applicant respectfully submits that nowhere does Huang disclose teach or suggest the feature of an opening formed in said third and second film sections of said dielectric film as recited in claim 1. Therefore, Huang and Stamper either individually or in combination fail to disclose, teach or suggest every feature of claim 1. Accordingly, Huang and Stamper either individually or in combination fail to render obvious the subject matter of claim 1 and claim 7, which depends from claim 1, under 35 U.S.C. §103(a). Withdrawal of the rejection of claim 7 under 35 U.S.C. §103(a) as anticipated by Huang and Stamper is respectfully solicited.

Furthermore, new claims 15 and 16 depend from claim 7, which in turn depends from claim 1. For the reasons outlined above, Applicant respectfully submits that claims 15 and 16 should be allowable over Huang and Stamper either individually or in combination under 35 U.S.C. §102(e) and/or §103(a).

For the reasons stated above, the claimed invention is fully patentable over the cited references.

III. FORMAL MATTERS AND CONCLUSION

The Specification is amended to better conform to language found in the Summary of the Invention (page 4 line 25 to page 5, line 1) and claim 6 as originally filed. Specifically, the wiring lines 12 and 13 may also form, for example, conductive plugs.

In view of the foregoing, Applicant submits that claims 1-7, 15 and 16, all the claims presently being considered in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

Serial No. 09/532,892
Docket No. 00USFP465-M.K.

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The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 1/29/02

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend the paragraph from page 7, line 19 to page 10, line 10 as follows:

--As shown in Fig. 1, a low dielectric constant film 3 is formed on a silicon substrate 1 in the DRAM. The low dielectric constant film 3 is composed of film sections 3-1, 3-2 and 3-3 which are laminated in order. A wiring line structure 2 is formed in the low dielectric constant insulating film 3. The wiring line structure 2 is composed of wiring lines 4[,] and 5, wiring lines (e.g., conductive plugs) 12 and 13 and a fuse section 11. The wiring lines 4 and 5 are formed on the film section 3-2 of the low dielectric film 3. The fuse section 11 is formed on the film section 3-1 of the low dielectric film 3. As shown in Figs. 1 and 2, the low dielectric constant film 3 is covered by a passivation film 7 in the area between the wiring lines 4 and 5. A laser opening 8 is formed to the fuse section 11 through the passivation film 7 and the low dielectric constant insulating film 3 in the area between the wiring lines 4 and 5.--

IN THE CLAIMS:

Please amend claims 1, 4, 5 and 7 as follows:

1. (Amended) A semiconductor memory device, including a copper fuse section that is oxidized by a laser beam in an oxidizing environment, comprising:

a dielectric film including a first film section formed on a substrate, a second film section formed on said first film section, and a third film section formed over said second film section;

a wiring line structure, including:

a first and a second wiring [lines provided in] line, each of said first and second wiring lines formed on said second film section of said dielectric film and extending in an opposite direction;

[a] said copper fuse section [provided in] formed on said first film section of said dielectric film, [and connected to said first and second wiring lines] an end of said copper fuse section being connected to said first wiring line and another end of said copper fuse being connected to said second wiring line; and

an opening formed [to said copper fuse section through] in said third and second film sections of said dielectric film and between said first and second wiring lines, wherein [a] said opening provides access to said laser beam [is irradiated to] to oxidize said

copper fuse section [through said opening in an oxygenatmosphere] in said oxidizing environment.

4. (Amended) A semiconductor memory device according to claim 1, wherein at least one of said first and second wiring lines [is formed of] includes copper.

5. (Amended) A semiconductor memory device according to claim 2, wherein at least one of said first and second wiring lines [is formed of] includes copper.

7. (Amended) A semiconductor memory device according to claim 1, [wherein said dielectric film includes a first dielectric film and a second dielectric film on the first dielectric film, said copper fuse section being formed on said first dielectric film, and said semiconductor memory device] further [comprises] comprising a [third] wiring line formed [of copper on] on said first section of said [first] dielectric film.